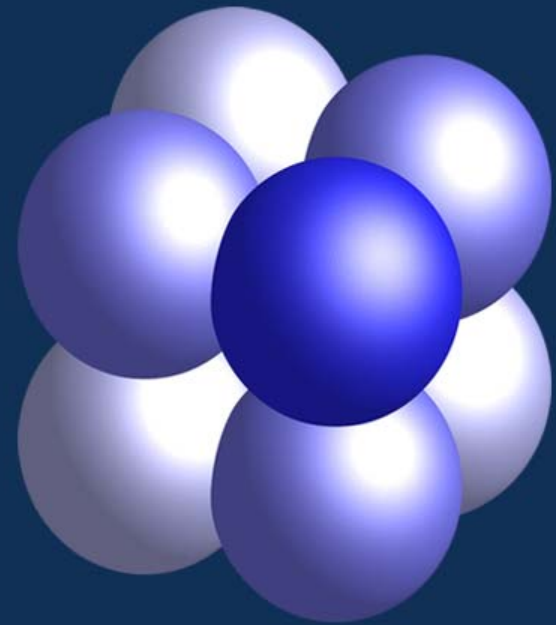


***Tecplot***<sup>®</sup>  
*Enjoy the View*<sup>™</sup>



## **Tecplot 10:**

***A versatile plotting package for engineers and scientists***

**Mike Peery, President**  
Amtec Engineering, Inc.  
Bellevue, Washington, USA

AMTEC<sup>®</sup>



**News:**

# Tecplot 10

To be released September 2003



## Where Is Amtec?



### Headquarters:

13920 SE Eastgate Way, #220  
Bellevue, Washington



**Branch Office in Houston, Texas**



## A Few of Our Customers

- **Earth Sciences**
  - Army Corps of Engrs.
  - ChevronTexaco
  - USGS
  - Unocal
  - Woods Hole
- **Aerospace**
  - Boeing
  - Cessna
  - General Electric
  - Jet Propulsion Lab
  - Lockheed Martin
  - NASA Research Ctrs.
  - Northrop Grumman
  - ONERA
  - Pratt & Whitney
  - Raytheon
  - Rolls Royce
  - Solar Turbines
- **Manufacturing**
  - 3M
  - Applied Materials
  - Caterpillar
  - Ford Motor Company
  - Intel
  - John Deer
  - Monsanto
- **Dept of Defense & US Gov.**
  - Electric Boat
  - Edwards AFB
  - Naval Research Lab
  - Naval Surface Warfare Center
  - NIH
  - NIST
  - US ARL
  - US Food & Drug Admin.
  - Wright Patterson AFB
- **Academic Institutions**
  - Berkeley
  - CalTech
  - Georgia Tech
  - MIT
  - Purdue
  - Princeton
  - Stanford
  - Univ. of Illinois UC
  - Univ. of Michigan
- **National Labs**
  - Argonne
  - Knolls Atomic Power
  - Los Alamos
  - Lawrence Livermore
  - Lawrence Berkeley
  - Oak Ridge
  - Pacific Northwest
  - Sandia



# Steps in Numerical Simulation

## (CFD - Computational Fluid Dynamics)

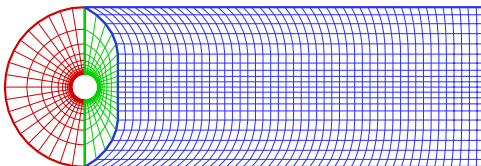
### Pre Processing

Problem Def.  
Geometry Def.  
Grid Generation

Problem: air flow around a cylinder

○ ← geometry definition

grid generation



At each node all you know is the  
grid location (X, Y)

### Numerical Model

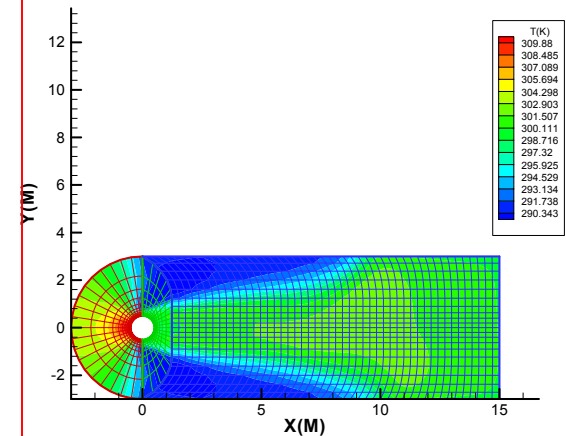
Solver  
(CFD Code)



Numerical model generates  
solution for physical properties  
at each grid node (Temperature,  
Pressure, Density, Velocity)

### Post Processing

Visualization



Plot results  
(Temperature Contour)



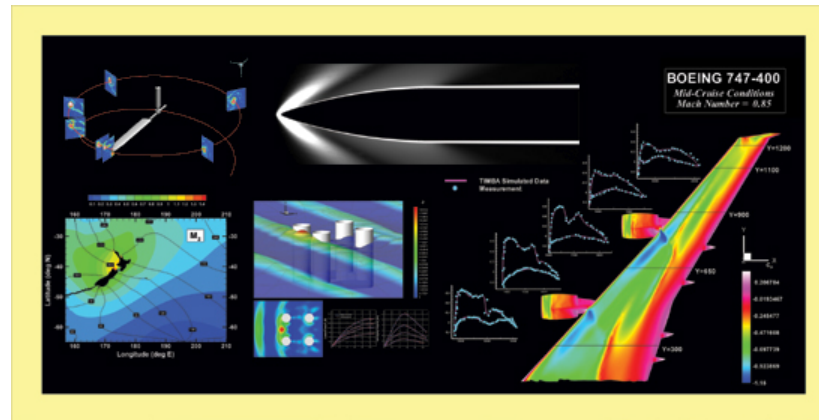
## Tecplot Product Family

- **Tecplot** (flagship product)
  - CFD Analyzer Add-on
- **Tecplot Edge** (for application developers)
- **Tecplot RS** (for oil & gas reservoir simulation)
- **Tecplot Solution Services**
  - Application development services
  - Consulting and applications
  - Training
  - Technical support



# What is Tecplot?

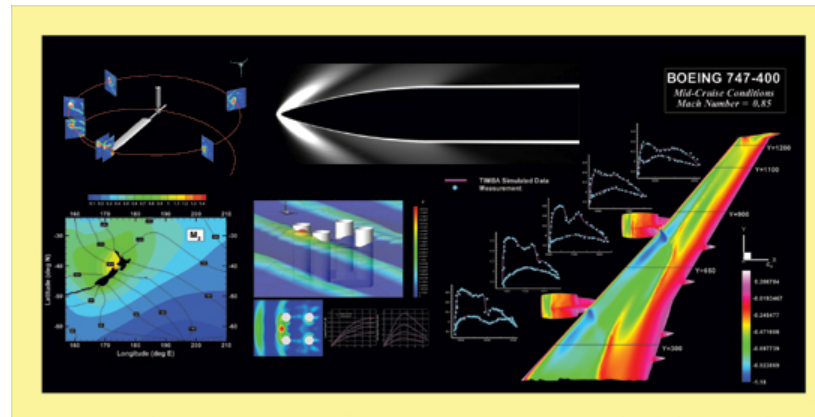
- Tecplot is plotting software with extensive XY, 2-D and 3-D capabilities.
- A “One-Stop Shop” for engineering/scientific data visualization





## Who is Tecplot For?

- Engineers/scientists
- Need to analyze, explore and plot numerical simulation and/or experimental data
- Want convenient point & click plotting
- Want one program for making wide range of charts, graphs, plots for publication and presentations
- Want an affordable program for entire department







# What Does Tecplot Do?

## Tecplot helps you:

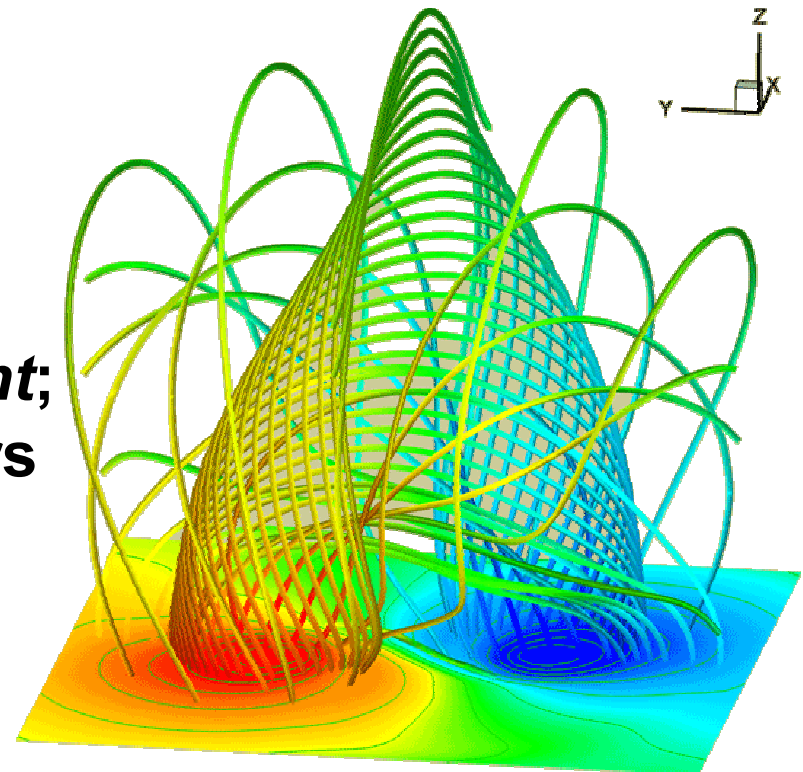
- **Plot** *(integrated XY, 2-D, 3-D)*
- **Explore** *(slice, iso-surface, streamlines, ...)*
- **Manipulate** *(Fortran-like operations)*
- **Automate** *(macros, Quick Macro Panel)*
- **Communicate** *(high-quality output)*
- **Collaborate** *(read/write to URL, publish to html)*
- **Customize** *(Add-on Developers Kit)*



# What Do You Get From Tecplot?

- Control of your plots
- High-quality plots and animations
- Satisfaction from seeing your work in *its best light*; and sharing it with others

Visualizing the Dynamics of the Sun  
Evolution of Coronal Loops



October 2002 **PLOT OF THE MONTH**



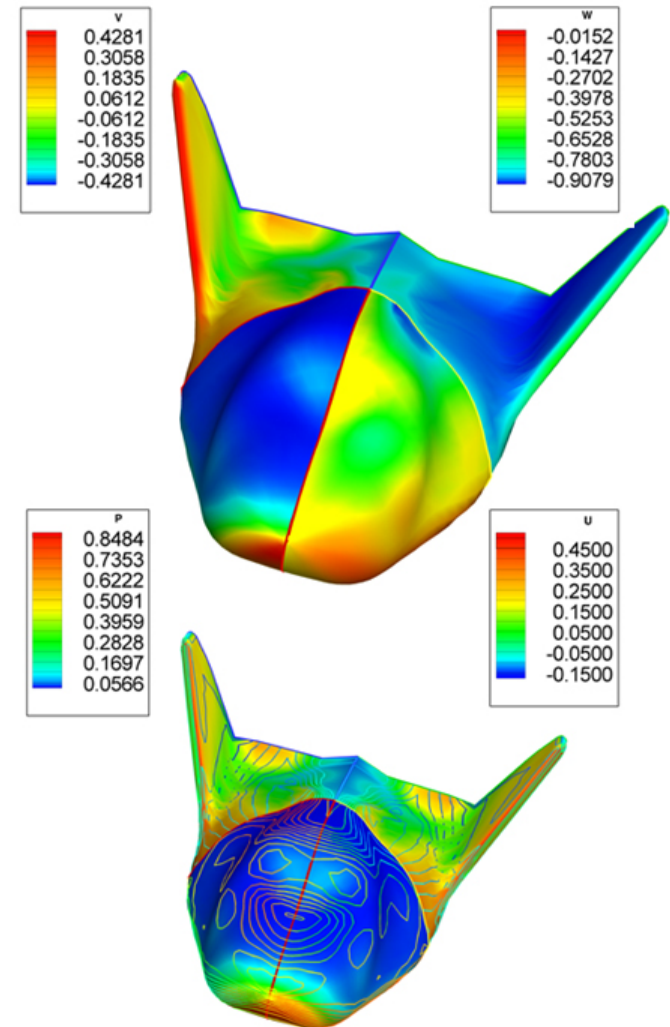
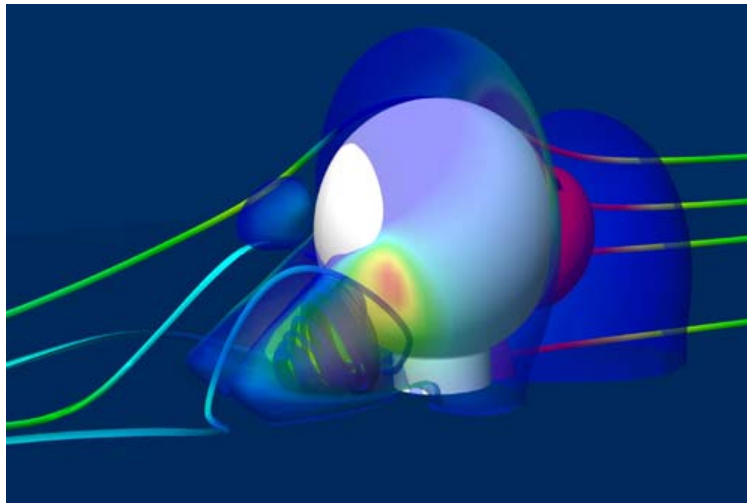
## **What's New in Tecplot 10?**

- **Data management**
- **New Plotting Tools**
- **Interface Improvements**



## New Plotting Tools

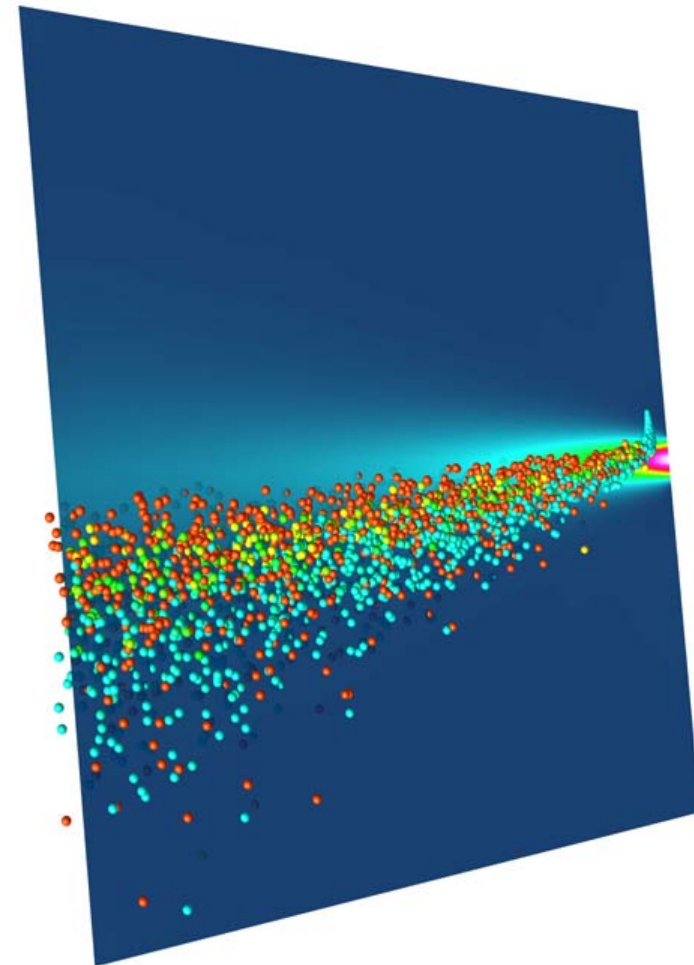
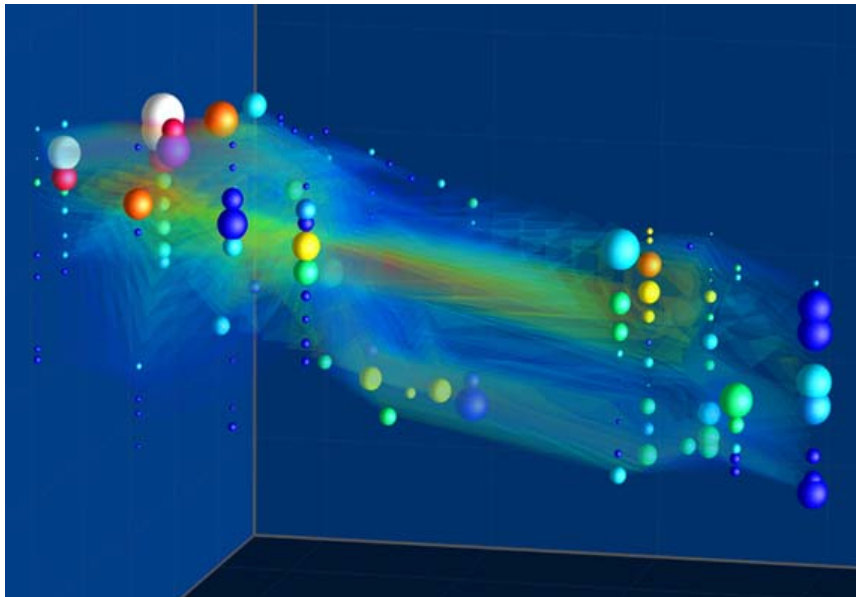
- **Multiple Contour Variables**
  - Zones can have different contour variables
  - Separate variables for isosurfaces and contours





## New Plotting Tools

- **3D Scatter Symbols**
  - Spheres, cubes & octahedrons
  - Size scaled by a field variable



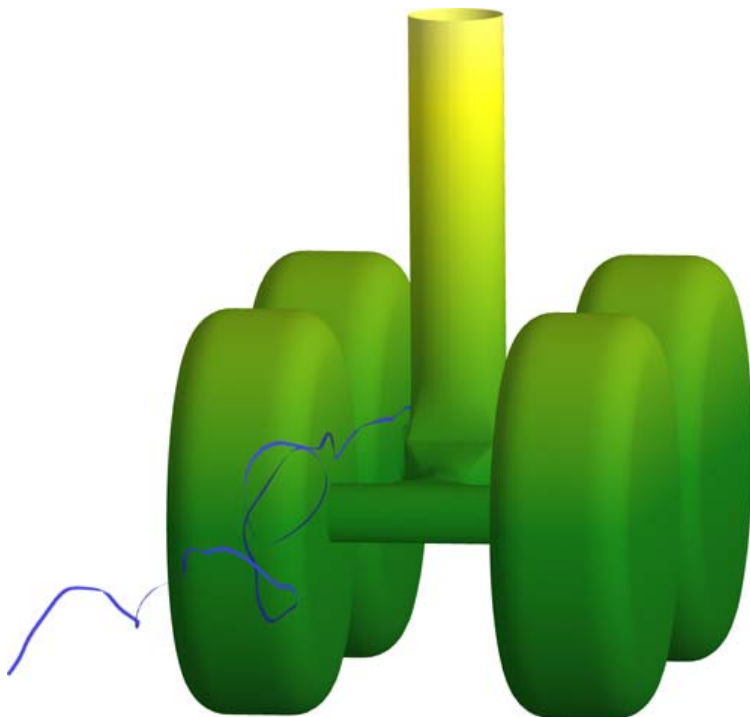


# New Plotting Tools

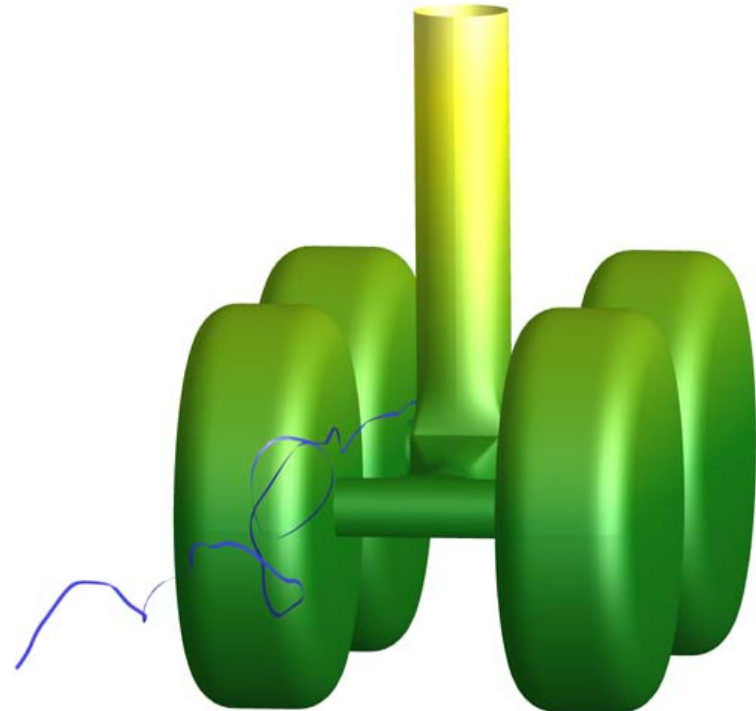
Add realism for presentation impact.

- **Specular Highlights**

**No Specular Highlights**



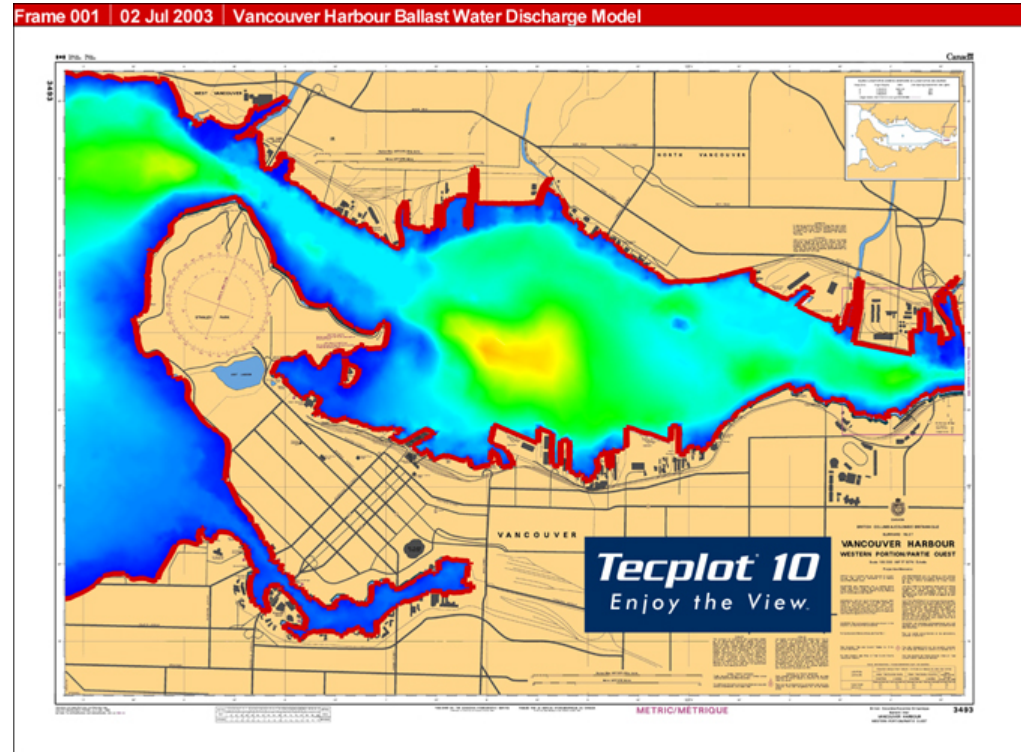
**Specular Highlights**





# New Plotting Tools

- **Image Import**
  - Logos
  - Bitmapped photos (images) incorporated with plot.



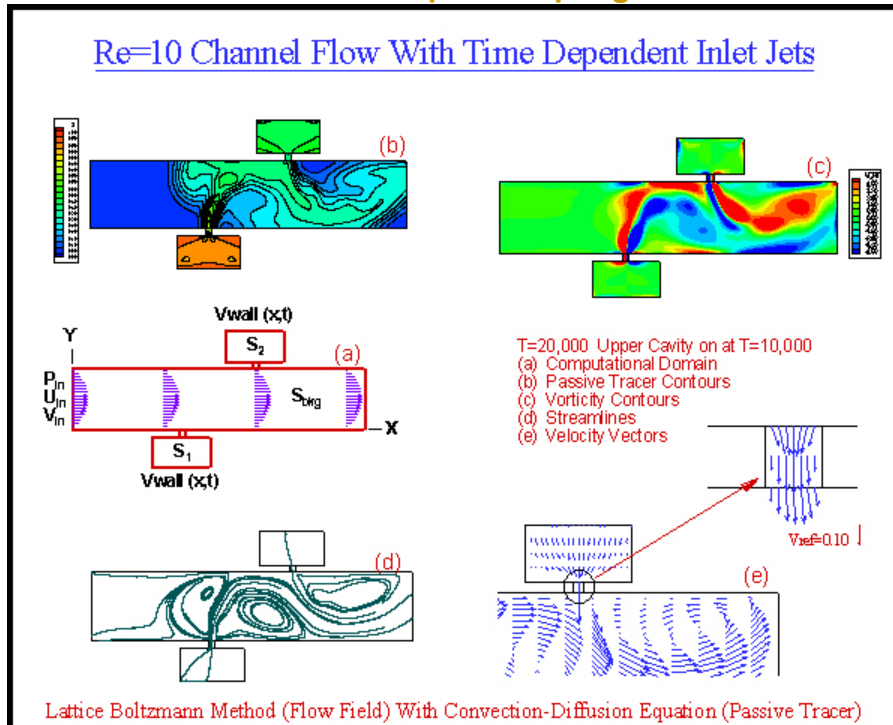




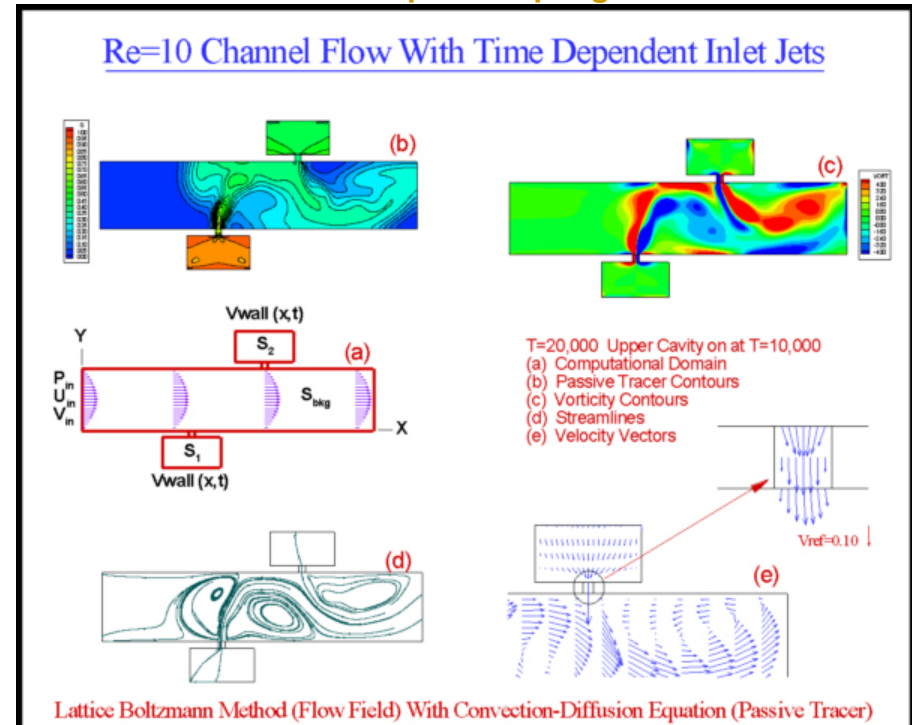
# New Plotting Tools

- **Super Sampling for High-quality Output**
  - Remove “jaggies” with anti-aliasing

No Super Sampling



Super Sampling

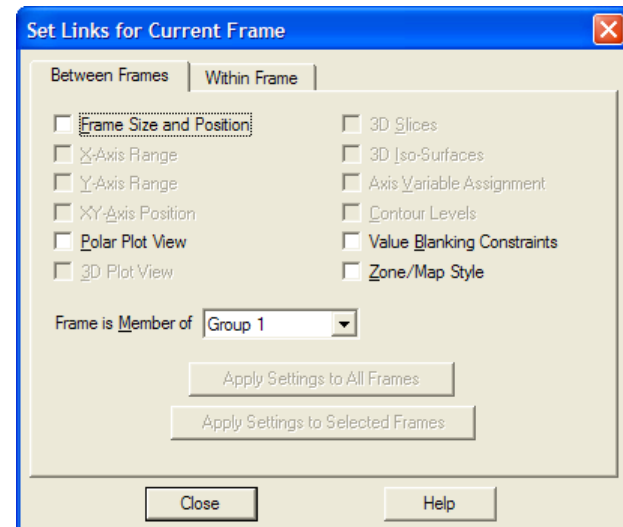






# New Plotting Tools

- **Frame Linking Capabilities**
  - Between frames
  - Within frames

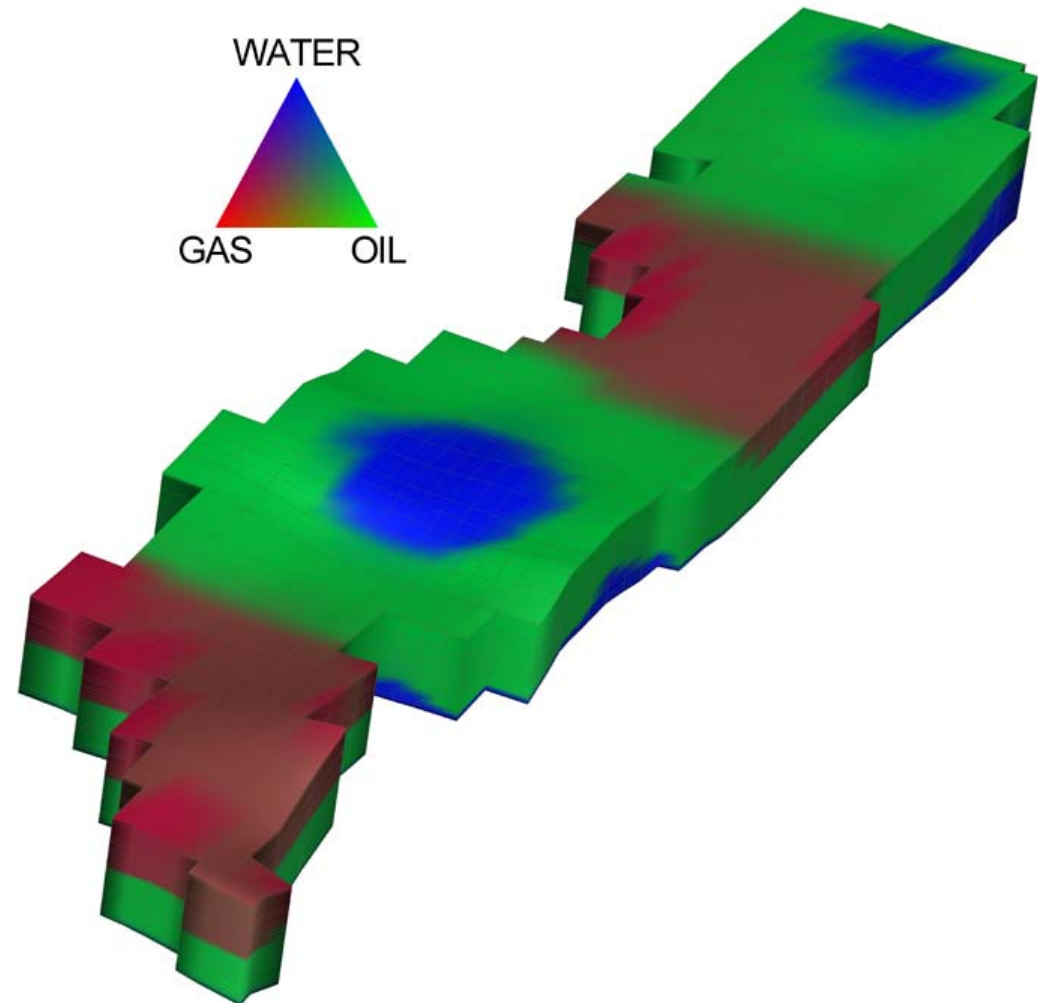




## New Plotting Tools

- **RGB Color Flooding**

- Red, Green, and Blue proportional to values of up to three variables
- General pseudo-coloring capability
- Multi-phase and multi-component flows

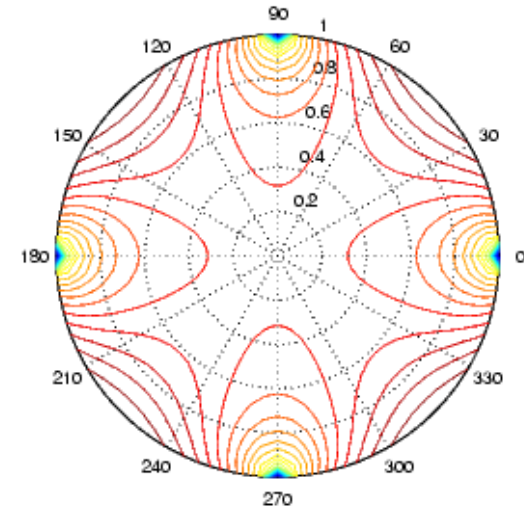
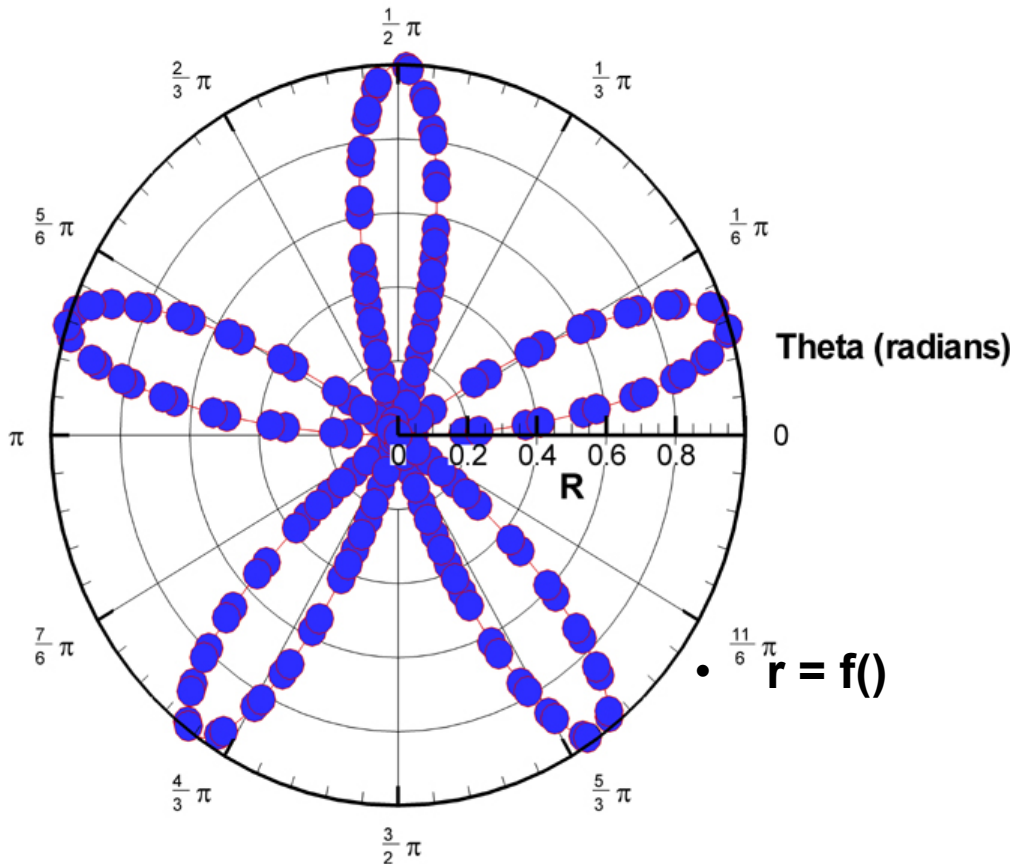




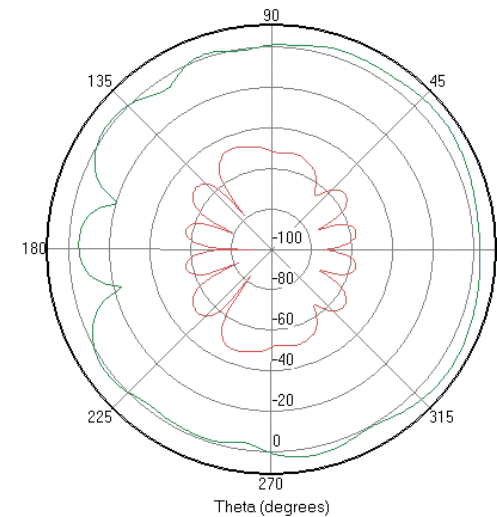
# New Plotting Tools

Important engineering plot,  
especially for electrical engineers.

- Polar Line Plots:  $r = f(\theta)$**



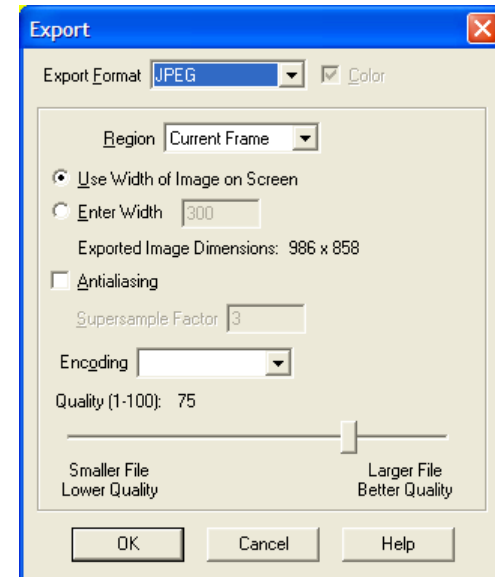
Gain, Phi=0 Plane - Vivaldi Antenna





# New Plotting Tools

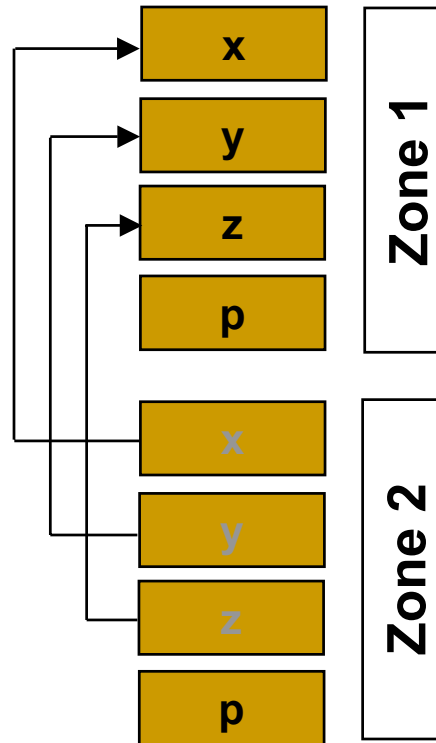
- **Export images as JPEG**
  - Standard format for compressing and displaying images in HTML documents on the Web
  - Control lossy compression (quality) with Quality slider bar



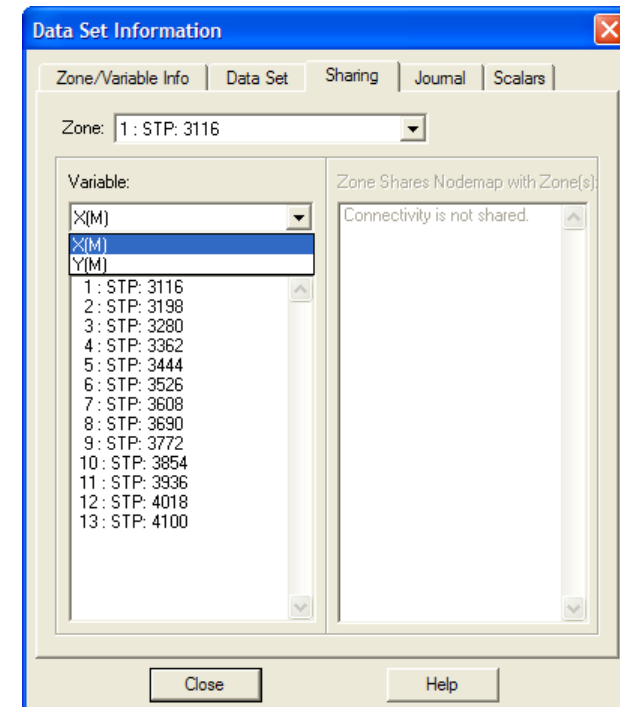


# Data Management

- **Variable & Node Map Sharing**
  - Reduce memory usage by sharing variables between zones (data blocks)
  - Time-dependent or iterative solutions only need one grid



Another important way to manage large data files and conserve disk and RAM.



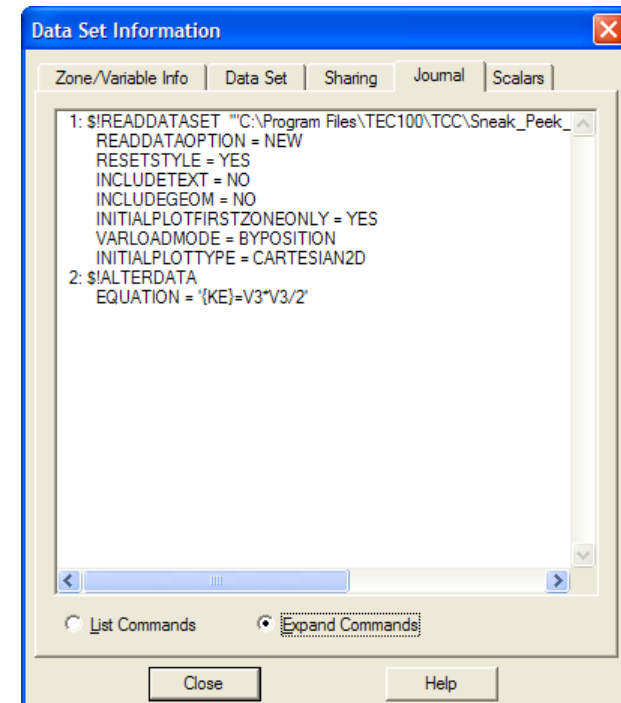
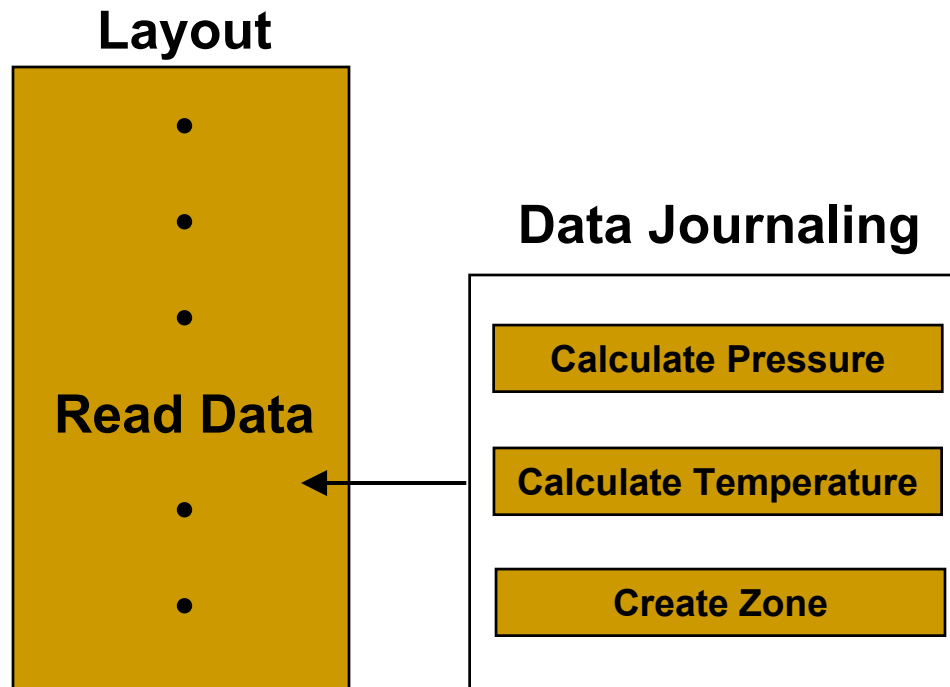


# Data Management

This is important for very large data files.

- **Data Journaling**

- Save data alteration equations & operations in Layout File
- Keep original data intact
- No need to save modified data file



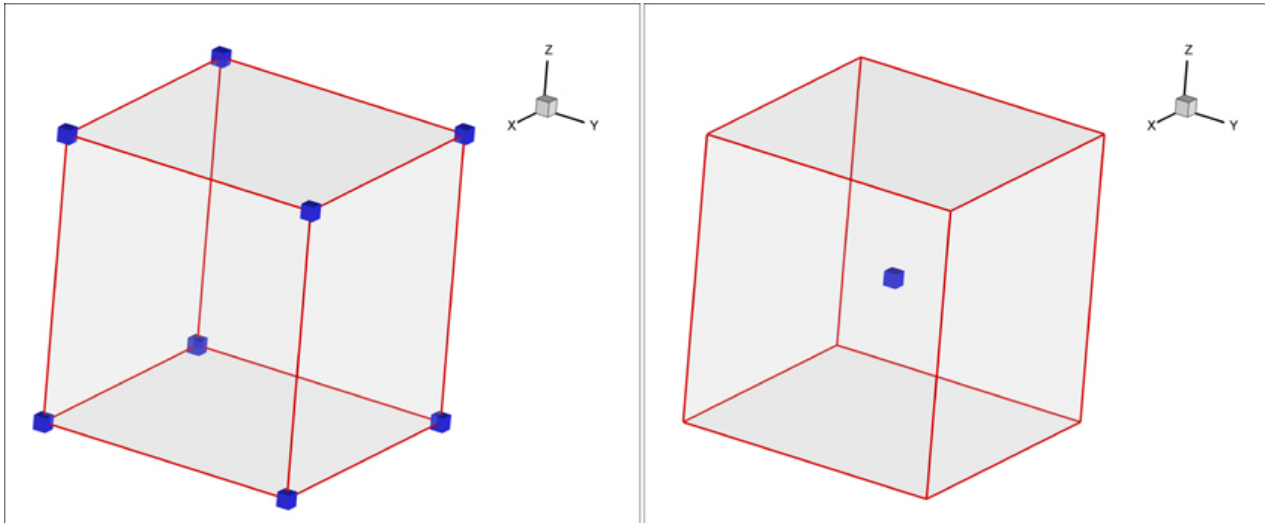




# Data Management

- **Cell-Centered Grid Structures**
  - Read and display cell-centered data
  - Mixed node and cell-centered data

Numerical simulation results have complex grid structures (FEM, finite-difference). Variables are stored in different places on each element. Important for other data types.







## Data Management

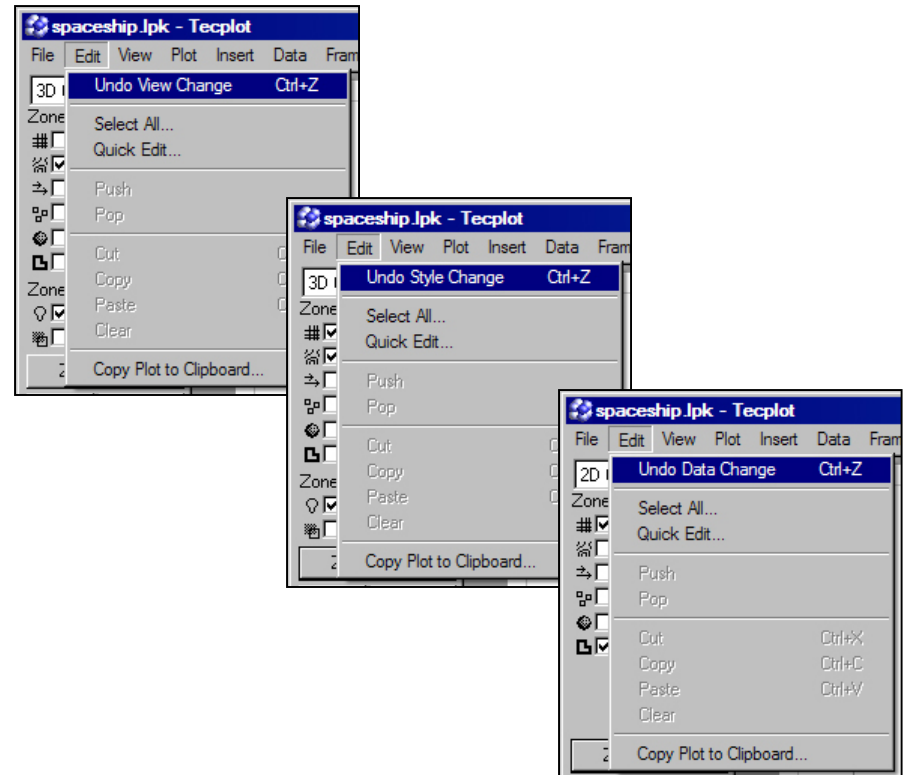
- **64-bit on Selected Platforms (SGI, ...)\***
  - Larger address space (larger data files)
  - Faster on some computers

*(\*May be post release.)*



# Interface Improvements

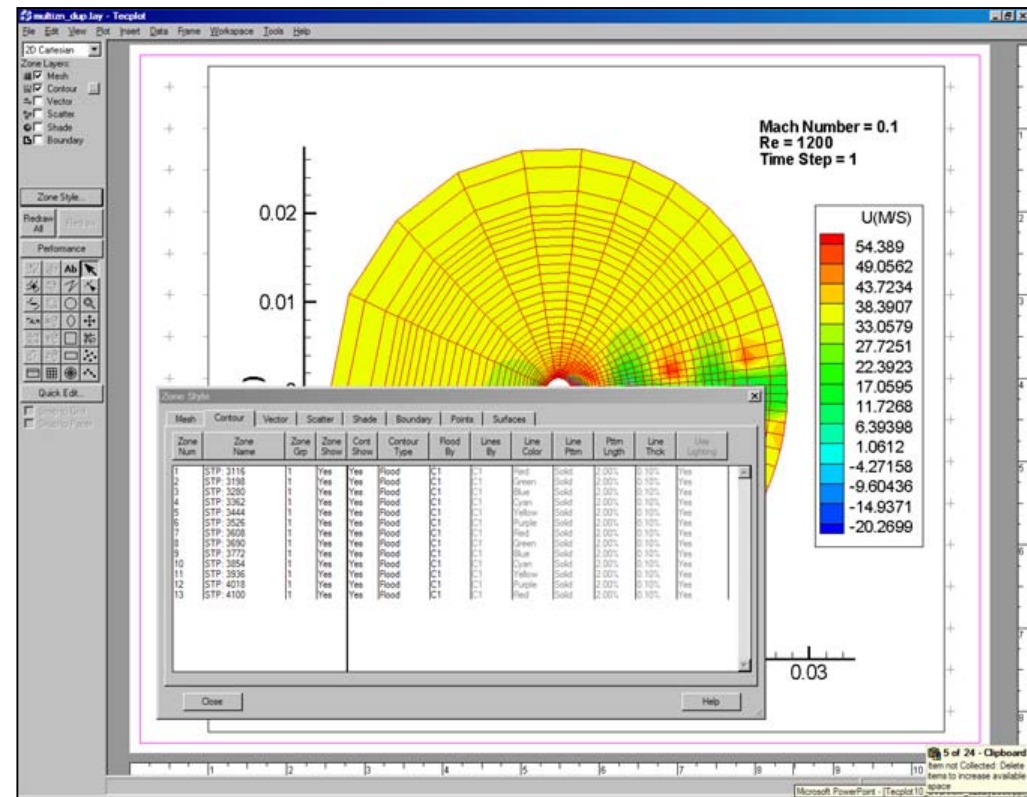
- **Undo**
  - View changes
  - Style changes
  - Data operations





# Interface Improvements

- **Resizable Map/Zone Style Dialog**
  - Resize Map/Zone dialog to work with a large number of Maps/Zones
- **Improved Data Loaders**
  - Plot3D, CGNS, Fluent, ...



5 of 24 - Clipboard  
Item not Collected. Delete  
Items to increase available



## **Tecplot's Road Map (vers.11,12)**

- **Handle ever larger data sets**
  - Faster file loading
  - Files >> local memory
  - Remote data files
  - Time-dependent data conveniences
- **More plot types**
- **Programmability/math analysis capabilities**
- **Continue to make easier and more convenient**



## **Tecplot 10: *Show 'n Tell***